

We claim:

1. A control cartridge comprising:
  - a first member that carries a Hall effect sensor,
  - a second member that carries a magnet and that rotates and translates with respect to the first member,
    - means to position the first member with respect to the second member so that the Hall effect sensor senses a predetermined magnetic flux density of the magnet,
    - means to change the magnetic flux density sensed by the Hall effect sensor in one direction responsive to rotation of the second member with respect to the first member in a first direction, and
    - means to change the magnetic flux density sensed by the Hall effect sensor in an opposite direction responsive to translation of the second member with respect to the first member.
2. The control cartridge as defined in claim 1 wherein the magnetic flux density sensed by the Hall effect sensor is increased responsive to the rotation of the second member with respect the first member in the first direction, and
  - the magnetic flux density sensed by the Hall effect sensor is decreased responsive to translation of the second member with respect to the first member.
3. The control cartridge as defined in claim 1 including a cam carried by one of the first and second members and a cam follower carried by another of the first and second members, the cam follower moving away from the cam responsive to rotation of the second member with respect to the first member in the first direction and engaging the cam and translating the another of the first and second members with respect to the one of the first and second members responsive to rotation of the second member with respect to the first member in an opposite direction.
4. The control handle as defined in claim 3 wherein the magnetic flux density sensed by the Hall effect sensor is increased responsive to the rotation of the

second member with respect the first member in the first direction, and the magnetic flux density sensed by the Hall effect sensor is decreased responsive to translation of the second member with respect to the first member.

5. A control cartridge comprising:  
a circuit board that includes a Hall effect sensor,  
a housing for fixing the position of the Hall effect sensor; the housing having a cam, and  
a shaft that carries a magnet and that rotates and translates with respect to the housing; the shaft having a cam follower that engages the cam and translates the shaft with respect to the housing when the shaft is rotated with respect to the housing in one direction but not in an opposite direction.

6. A control handle for a vehicle that is steered by a tubular handle bar and that has an engine control device and a cruise control device, the control handle comprising:

a control cartridge disposed in an open end of the tubular handle bar,  
and

a hand grip rotatably mounted on the exterior of the handle bar adjacent the open end,

the control cartridge including a circuit board upon which a Hall effect sensor is mounted,

a housing receiving the circuit board and fixing the position of the Hall effect sensor; the housing being non-rotatably mounted in the end of a tube and having a cam,

a shaft inside the tube that carries a magnet and that rotates and translates with respect to the housing; the shaft having a cam follower that engages the cam and translates the shaft with respect to the housing when the shaft is rotated with respect to the housing in one direction but not in an opposite direction,

a collar non-rotatably mounted in an opposite end of the tube,

a spring disposed in the tube and biasing the shaft rotationally so that the cam follower engages the cam;

the collar being disposed in the tubular handle bar snugly, and  
the shaft having an end that protrudes out of the collar; the end being  
non-rotatably attached to the hand grip.

7. A control cartridge comprising:  
a first member that carries a Hall effect sensor,  
a second member that carries a magnet and that rotates and translates  
with respect to the first member,  
a cam carried by one of the first and second members and a cam  
follower that is carried by another of the first and second members and biased into  
engagement with the cam to position the first member with respect to the second  
member so that the Hall effect sensor senses a predetermined magnetic flux density of  
the magnet,  
means to change the magnetic flux density sensed by the Hall effect  
sensor in one direction responsive to rotation of the second member with respect to  
the first member in a first direction, and  
means to change the magnetic flux density sensed by the Hall effect  
sensor in an opposite direction responsive to translation of the second member with  
respect to the first member.

8. The control cartridge as defined in claim 7 wherein the magnetic flux  
density sensed by the Hall effect sensor is increased responsive to the rotation of the  
second member with respect the first member in the first direction, and the magnetic  
flux density sensed by the Hall effect sensor is decreased responsive to translation of  
the second member with respect to the first member.

9. The control cartridge as defined in claim 7 wherein the cam follower  
moves away from the cam responsive to rotation of the second member with respect  
to the first member in the first direction and translates the another of the first and  
second members with respect to the one of the first and second members responsive to  
rotation of the second member with respect to the first member in an opposite  
direction.

10. The control cartridge as defined in claim 9 wherein the magnetic flux density sensed by the Hall effect sensor is increased responsive to the rotation of the second member with respect the first member in the first direction, and  
the magnetic flux density sensed by the Hall effect sensor is decreased responsive to translation of the second member with respect to the first member.